Federal Democratic Republic of Ethiopia

☞ EDICT OF GOVERNMENT ☜

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ET 393.DS (2012) (English): EDIBLE SALT - DETERMINATION OF ARSENIC CONTENT

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ETHIOPIAN STANDARD

ES 393:2000

(Reaffirmation: 2012)

First edition

Edible salt — Determination of arsenic content

ICS: 67.220.20

Published by Ethiopian Standards Agency

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Food Additives and Contaminants (TC21) and published by the Ethiopian Standards Agency (ESA). The standard is a reaffirmation for reprint of the Ethiopian Standard ES 393:2000, Edible salt-Determination of arsenic content , with some editorial changes without altering the technical contents in the former text.

Edible salt — Determination of arsenic content

1 Scope

This Ethiopian Standard specifies the routine method for the determination of arsenic content in salt.

2 Normative reference

The following standard contains provisions, which through reference in this text constitute the provisions of this Ethiopian Standard. At the time of publication the edition indicated was valid. All standards are subject to revision and parties to agreements based on this Ethiopian Standard are encouraged to investigate the possibility of applying the most recent edition of the Ethiopian Standard indicated below. Registers of currently valid standards are maintained in the Quality and Standards Authority of Ethiopia.

ES 299:2000, *Sampling*.

3 Reagents

The following reagents of recognized analytical reagent quality shall be used:

3.1 Lead acetate solution — Prepare 1 per cent solution of lead acetate by adding enough acetic acid, to clear the solution.

3.2 Dry lead acetate paper — Shake large sheets of qualitative filter paper in lead acetate solution and dry. Cut the paper into pieces measuring 70 x 50 mm.

3.3 Mercuric chloride solution — approximately 0.35 per cent, aqueous

3.4 Mercuric chloride paper strips — Cut filter paper No. 0 into four equal squares and dip into mercuric chloride solution. The paper shall be of uniform thickness, otherwise there would be irregularity in the length of the stain for the same amount of arsenic. Handle the squares in an atmosphere free from gas fumes, hydrogen sulphide being particularly undesirable. When it dries, about 1 cm of the outer edge shall be trimmed off and the paper shall be cut into strips of 70 mm X 2.5 mm. The strips shall be preserved in bottles with light fitting stoppers. Strips with a white deposit of mercuric chloride shall not be used.

3.5 Mixed acid — dilute 1 volume of concentrated sulphuric acid with 4 volumes of water, and add to this 10g of pure sodium chloride for every 100 ml of the solution .

3.6 Ferric ammonium sulphate solution —dissolve 84g of ferric ammonium sulphate in water with 10 ml of mixed acid and made up to 1 litre.

3.7 Stannous chloride solution — dissolve 80g of stannous chloride in 10 ml of water containing 5 ml of concentrated hydrochloric acid.

3.8 Zinc shots — treat and dissolve arsenic free zinc shots passing a sieve of aperture 5660 microns and retained on a sieve of aperture 2818 microns with concentrated hydrochloric acid until the surface of zinc sheets becomes clean and dull. Wash and keep covered with water.

3.9 Sodium hydroxide solution, approximately 20 per cent, aqueous.

3.10 Sulphuric acid, diluted.

3.11 Sulphuric acid, concentrated.

3.12 Arsenic trioxide — Dissolve standard solution 1.000g of resublimed arsenic tiroxide in 15 ml of sodium hydroxide solution and neutralize with dilute sulphuric acid. Dilute with freshly distilled water to which 10 ml of concentrated sulphuric acid per litre has been added. It shall be made up to volume to 1000 ml. 10 ml of this solution shall again be diluted to 1 litre with water containing sulphuric acid and finally 100 ml of the latter solution shall be diluted to 1 litre with water containing sulphuric acid and finally 100 ml of the latter solution shall be diluted to 1 litre with water containing sulphuric acid. One millilitre of the final solution contains 0.001 mg of arsenic trioxide (as AS_2O_3).

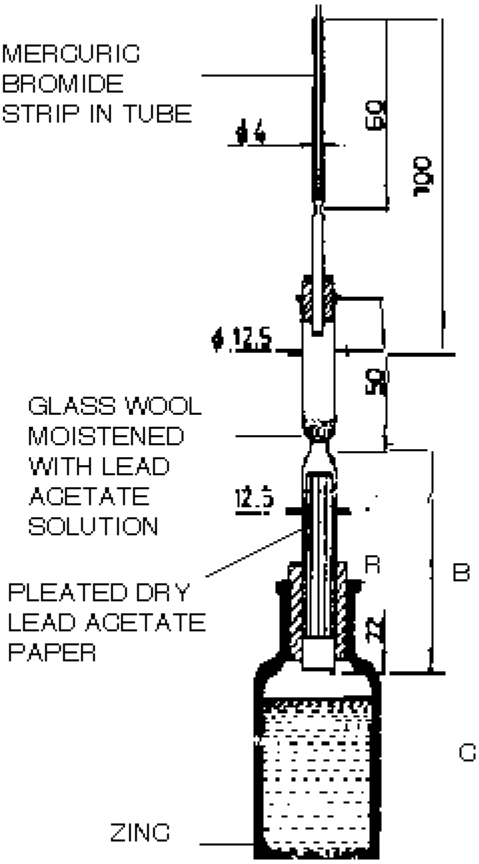
MERCURIC BROMIDE STRIP IN TUBE
ϕ4
60
100
ϕ12.5
50
GLASS WOOL MOISTENED WITH LEAD ACETATE SOLUTION
12.5
R
B
PLEATED DRY LEAD ACETATE PAPER
22
C
ZINC

Figure: Apparatus for test arsenic

4 Apparatus

The apparatus as shown in the following figure shall be used.

5 Sampling

Samples shall be taken in accordance with ES 299.

6 Procedure

6.1 Test portion

Weigh, to the nearest 0.001g, 10 g of the test sample.

6.2 Determination

Place the dry lead acetate paper in the lower portion of Tube B and close with glass wool moistened with lead acetate solution in its upper portion. Place the mercuric chloride paper strip in the Tube A and introduce solution in the Gutzeit bottle C. Dissolve the test portion in about 30ml of water and quantitatively transfer to the Gutzeit bottle, washing with minimum quantity of water. Add 10g of zinc shots and the apparatus is immediately fitted. Place the bottle in a warm place at about 40°C. Remove the paper strip at the end of 45 minutes. Carry a control experiment in exactly the same manner, using 10 ml of standard arsenic trioxide solution in place of the material.

7 Expression of results

Take the material to have not exceeded the limit prescribed in Table 2 of ES 298 if the length and intensity of colour of the stain produced with the material are not greater than the length and intensity of colour of the stain obtained in the control experiment.

8 Test report

The test report shall include the following information:

a) a reference to this Ethiopian Standard;

b) the result and method of expression used;

c) all information necessary for complete identification of sample;

d) any unusual features noted during the determination; and

e) any operation not included in this Ethiopian Standard or in the Ethiopian Standard to which reference is made, or regarded as optional.

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Ethiopian Standards Agency

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010.ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes. Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM).It is a founding member of the African Regional Organization for standardization (ARSO).

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